

ABSTRACT

Photonic crystal units (10a, 10b, and 10c) are formed by an optical molding process using a photocurable resin, and partitions (11) are provided at the boundaries therebetween. The voids in each photonic crystal unit are filled with a second substance containing ceramic particles dispersed therein to form a filled portion 2. A plurality of three-dimensional periodic structure units containing the first and second substances distributed with three-dimensional periodicity are arranged so as to have different ratios between the dielectric constants of the first and second substances. Therefore, present invention provides a three-dimensional periodic structure having a wide photonic band gap which could not be obtained in a conventional three-dimensional periodic structure.